We claim:

1. A data storage device comprising:

a conduction barrier;

a probe tip mounted on a suspension mechanism;

a voltage source coupled to the suspension mechanism for emitting a current of electrons through the conduction barrier; and

a sensing mechanism for sensing a magnitude of the emitted current wherein the magnitude of the current of electrons is based on a distance between the probe tip and the sensing mechanism.

2. The data storage device of claim 1 wherein the sensing mechanism further comprises:

a conduction region coupled to the conduction barrier; and

at least two electrical contacts coupled to the conduction region for monitoring the current induced in the conduction region by the current of electrons emitted from the probe tip.

3. The data storage device of claim 2 wherein the conduction region comprises a cathodoconductive material.

4. The data storage device of claim 2 wherein the at least two electrical contacts are aligned in a vertical fashion with respect to the conduction region.

5. The data storage device of claim 1 wherein the conduction barrier further comprises at least one layer of polymer material.

6. The data storage device of claim 5 wherein the at least one layer of polymer material comprises a wear resistant polymer material.

7. The data storage device of claim 5 wherein the polymer material is a topographic data storage medium.

8. The data storage device of claim 6 wherein the conduction barrier further comprises

a second layer of material wherein the second layer of material comprises a second polymer material wherein the second polymer material is harder than the first polymer material.

9. The data storage device of claim 1 wherein the suspension mechanism and the sensing mechanism are both built onto a platform.

10. The data storage device of claim 1 further comprising:

an anode coupled to the conduction barrier wherein the anode comprises a conductive layer of material; and

wherein the sensing mechanism includes at least one electrical contact coupled to the anode for monitoring the magnitude of the current of electrons.

11. The data storage device of claim 1 further comprising an insulating layer as part of the conduction barrier.

12. The data storage device of claim 11 wherein the insulating layer further comprises an oxide layer.

13. The data storage device of claim 1 wherein the sensing mechanism further comprises a charged particle detector.

14. The data storage device of claim 13 wherein the charged particle detector comprises at least one of a cathododiode, a cathodotransistor or an avalanche diode.

15. The data storage device of claim 1 wherein the voltage source is coupled to the probe tip.

16. A method of reading data in data storage device comprising:

providing a conduction barrier wherein the conduction barrier includes a data storage medium;

suspending a probe tip over the conduction barrier via a suspension mechanism;

emitting a current of electrons through the conduction barrier from a voltage source coupled to the suspension mechanism; and

sensing a magnitude of the current of electrons emitted from the voltage source with a sensing mechanism wherein the magnitude of the current of electrons is based on a distance between the probe tip and the sensing mechanism.

17. The method of claim 16 wherein the act of sensing a magnitude of the current further comprises:

coupling a conduction region to the conduction barrier; and

coupling at least two electrical contacts to the conduction region for monitoring the current induced in the conduction region by the electrons emitted from the voltage source.

18. The method of claim 17 wherein the conduction region comprises a cathodoconductive material.

19. The method of claim 17 wherein coupling the at least two electrical contacts to the conduction region further comprises coupling the at least two electrical contacts to the conduction region in a vertical fashion.

20. The method of claim 16 further comprising the act of:

building a conduction region into the suspension mechanism.

21. The method of claim 16 wherein the act of providing a conduction barrier further comprises:

coupling an anode to the conduction barrier wherein the anode comprises a conductive layer of material.

22. The method of claim 21 wherein the act of sensing a change in current further comprises:

coupling at least one electrical contact to the conductive layer of material for monitoring the current of electrons emitted from the voltage source.

23. The method of claim 16 wherein the act of providing a conduction barrier further comprises:

including an insulating layer in the conduction barrier.

24. The method of claim 23 wherein the insulating layer further comprises an oxide layer.

25. The method of claim 16 wherein the act of sensing a magnitude of current based on the current of electrons emitted from the voltage source with a sensing mechanism further comprises:

coupling a charged particle detector to the conduction barrier.

26. The method of claim 25 wherein the charged particle detector comprises at least one of a cathododiode, a cathodotransistor or an avalanche diode.

27. A data storage system comprising:

means for providing a conduction barrier wherein the conduction barrier includes a data storage medium;

means for suspending a probe tip over the conduction barrier via a suspension mechanism;

means for emitting a current of electrons through the conduction barrier from a voltage source connected to an emitting region of the suspension mechanism; and

means for sensing a magnitude of the current of electrons emitted from the voltage source with a sensing mechanism wherein the magnitude of the current of electrons is based on a distance between the probe tip and the sensing mechanism.

28. A computer system comprising:

a central processing unit; and

a data storage device coupled to the central processing unit comprising:

a conduction barrier;

a probe tip mounted on a suspension mechanism;

a voltage source coupled to the suspension mechanism for emitting a current of electrons through the conduction barrier; and

a sensing mechanism for sensing a magnitude of the emitted current wherein the magnitude of the current of electrons is based on a distance between the probe tip and the sensing mechanism.